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JC973 U.S. PTO  
10/002732  
11/15/01

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Charles W.C. Lin

Title: SUPPORT CIRCUIT WITH A TAPERED THROUGH-HOLE  
FOR A SEMICONDUCTOR CHIP ASSEMBLY

Serial No.: Unknown Filed: Herewith

Examiner: Unknown Group Art Unit: Unknown

Atty. Docket No.: P012-1

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ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

**INFORMATION DISCLOSURE STATEMENT**

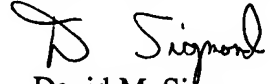
Pursuant to Applicant's duty of disclosure under 37 C.F.R. § 1.56 and §§ 1.97-1.98,  
Applicant hereby submits the enclosed Form PTO-1449.

Copies of documents cited on the enclosed Form PTO-1449 are not enclosed because  
they were previously cited by or submitted to the U.S. Patent Office in prior U.S. Application  
Serial No. 09/665,931 filed September 20, 2000. The above-identified application is a divisional  
of the prior application.

The filing of this Information Disclosure Statement shall not be construed as a  
representation that a search has been made, an admission that any of these documents, alone or in  
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any manner.

This Information Disclosure Statement is filed before the mailing date of a first Office  
Action. Accordingly, no fee is due.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "D. Sigmond". The signature is fluid and cursive, with the first letter "D" being large and stylized.

David M. Sigmond  
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Form PTO-1449

U.S. Department of Commerce, Patent and Trademark Office

Atty Docket No.

P012-1

Serial No.

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Filing Date

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 11/15/91  
 10/002732  
 973 U.S. PTO
**U.S. Patent Documents**

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	4,955,523	09/1990	Calomagno et al.	228	179	
	AB	4,970,571	11/1990	Yamakawa et al.	357	71	
	AC	4,984,358	01/1991	Nelson	29	830	
	AD	5,074,947	12/1991	Estes et al.	156	307.3	
	AE	5,106,461	04/1992	Volfson et al.	205	125	
	AF	5,116,463	05/1992	Lin et al.	156	653	
	AG	5,137,845	08/1992	Lochon et al.	437	183	
	AH	5,167,992	12/1992	Lin et al.	427	437	
	AI	5,196,371	03/1993	Kulesza et al.	437	183	
	AJ	5,209,817	05/1993	Ahmad et al.	156	643	
	AK	5,237,130	08/1993	Kulesza et al.	174	260	
	AL	5,260,234	11/1993	Long	437	203	
	AM	5,261,593	11/1993	Casson et al.	228	180.22	

**Foreign Patent Documents**

							Translation	
		Document	Date	Country	Class	Subclass	Yes	No
	AN	EP 0 718 882 A1	06/1996	European Patent Office	H01L	23/057		
	AO	WO 97/38563	10/1997	WIPO	H05K	1/03		

**Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)**

	AP	Markstein et al., "Controlling the Variables in Stencil Printing," Electronic Packaging & Production, February 1997, pp. 48-56.
	AQ	Elenius, "Choosing a Flip Chip Bumping Supplier - Technology an IC Package contractor should look for," Advanced Packaging, March/April 1998, pp. 70-73.

Examiner

Date Considered

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Group Art Unit

**U.S. Patent Documents**

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	5,275,330	01/1994	Issacs et al.	228	180.2	
	AB	5,284,796	02/1994	Nakanishi et al.	437	183	
	AC	5,293,067	03/1994	Thompson et al.	257	668	
	AD	5,327,010	07/1994	Uenaka et al.	257	679	
	AE	5,334,804	08/1994	Love et al.	174	267	
	AF	5,346,750	09/1994	Hatakeyama et al.	428	209	
	AG	5,355,283	10/1994	Marrs et al.	361	760	
	AH	5,358,621	10/1994	Oyama	205	123	
	AI	5,397,921	03/1995	Karnezos	257	779	
	AJ	5,407,864	04/1995	Kim	437	203	
	AK	5,424,245	06/1995	Gurtler et al.	437	183	
	AL	5,438,477	08/1995	Pasch	361	689	
	AM	5,439,162	08/1995	George et al.	228	180.22	

**Foreign Patent Documents**

							Translation	
		Document	Date	Country	Class	Subclass	Yes	No
	AN	WO 99/57762	11/1999	WIPO	H01L	23/48		
	AO							

**Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)**

	AP	Erickson, "Wafer Bumping: The Missing Link for DCA," Electronic Packaging & Production, July 1998, pp. 43-46.
	AQ	Kuchenmeister et al., "Film Chip Interconnection Systems Prepared By Wet Chemical Metallization," IEEE publication 0-7803-4526-6/98, June 1998, 5 pages.

Examiner

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Group Art Unit

**U.S. Patent Documents**

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	5,447,886	09/1995	Rai	437	183	
	AB	5,454,161	10/1995	Beilin et al.	29	852	
	AC	5,454,928	10/1995	Rogers et al.	205	125	
	AD	5,475,236	12/1995	Yoshizaki	257	48	
	AE	5,477,933	12/1995	Nguyen	174	262	
	AF	5,478,007	12/1995	Marrs	228	180.22	
	AG	5,483,421	01/1996	Gedney et al.	361	771	
	AH	5,484,647	01/1996	Nakatani et al.	428	209	
	AI	5,487,218	01/1996	Bhatt et al.	29	852	
	AJ	5,489,804	02/1996	Pasch	257	778	
	AK	5,493,096	02/1996	Koh	219	121.71	
	AL	5,508,229	04/1996	Baker	437	183	
	AM	5,525,065	06/1996	Sobhani	439	67	

**Foreign Patent Documents**

							Translation	
		Document	Date	Country	Class	Subclass	Yes	No
	AN							
	AO							

**Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)**

AP	Ghaffarian, "Long Time BGA Assembly Reliability," Advancing Microelectronics, Vol. 25, No. 6, September/October 1998, pp. 20-23.
AQ	U.S. Application Serial No. 09/465,024, filed December 16, 1999, entitled "Bumpless Flip Chip Assembly With Solder Via"

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Group Art Unit

**U.S. Patent Documents**

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	5,536,973	07/1996	Yamaji	257	737	
	AB	5,542,601	08/1996	Fallon et al.	228	119	
	AC	5,547,740	08/1996	Higdon et al.	428	209	
	AD	5,556,810	09/1996	Fujitsu	437	209	
	AE	5,556,814	09/1996	Inoue et al.	437	230	
	AF	5,564,181	10/1996	Dineen et al.	29	841	
	AG	5,572,069	11/1996	Schneider	257	690	
	AH	5,576,052	11/1996	Arledge et al.	427	98	
	AI	5,583,073	12/1996	Lin et al.	439	183	
	AJ	5,595,943	01/1997	Itabashi et al.	437	230	
	AK	5,599,744	02/1997	Koh et al.	437	195	
	AL	5,611,140	03/1997	Kulesza et al.	29	832	
	AM	5,611,884	03/1997	Bearinger et al.	156	325	

**Foreign Patent Documents**

							Translation	
		Document	Date	Country	Class	Subclass	Yes	No
	AN							
	AO							

**Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)**

	AP	U.S. Application Serial No. 09/464,562, filed December 16, 1999, entitled "Bumpless Flip Chip Assembly With Strips And Via-Fill"
	AQ	U.S. Application Serial No. 09/464,561, filed December 16, 1999, entitled "Bumpless Flip Chip Assembly With Strips-In-Via And Plating"

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Filing Date

Group Art Unit

**U.S. Patent Documents**

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	5,613,296	03/1997	Kurino et al.	29	852	
	AB	5,614,114	03/1997	Owen	219	121.66	
	AC	5,615,477	04/1997	Sweitzer	29	840	
	AD	5,619,791	04/1997	Lambrecht Jr. et al.	29	852	
	AE	5,627,405	05/1997	Chillara	257	668	
	AF	5,627,406	05/1997	Pace	257	700	
	AG	5,633,204	05/1997	Tago et al.	438	614	
	AH	5,637,920	06/1997	Loo	257	700	
	AI	5,641,113	06/1997	Somaki et al.	228	180.22	
	AJ	5,645,628	07/1997	Endo et al.	106	1.23	
	AK	5,646,067	07/1997	Gaul	437	180	
	AL	5,648,686	07/1997	Hirano et al.	257	778	
	AM	5,654,584	08/1997	Fujitsu	257	666	

**Foreign Patent Documents**

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**Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)**

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*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	5,656,858	08/1997	Kondo et al.	257	737	
	AB	5,663,598	09/1997	Lake et al.	257	737	
	AC	5,665,652	09/1997	Shimizu	438	127	
	AD	5,666,008	09/1997	Tomita et al.	257	778	
	AE	5,669,545	09/1997	Pham et al.	228	1.1	
	AF	5,674,785	10/1997	Akram et al.	437	217	
	AG	5,674,787	10/1997	Zhao et al.	437	230	
	AH	5,682,061	10/1997	Khandros et al.	257	666	
	AI	5,691,041	11/1997	Frankeny et al.	428	209	
	AJ	5,722,162	03/1998	Chou et al.	29	852	
	AK	5,723,369	03/1998	Barber	438	106	
	AL	5,731,223	03/1998	Padmanabhan	437	183	
	AM	5,736,456	04/1998	Akram	438	614	

**Foreign Patent Documents**

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		Document	Date	Country	Class	Subclass	Yes	No
	AN							
	AO							

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**U.S. Patent Documents**

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	5,739,585	04/1998	Akram et al.	257	698	
	AB	5,744,859	04/1998	Ouchida	257	668	
	AC	5,757,071	05/1998	Bhansali	257	697	
	AD	5,757,081	05/1998	Chang et al.	257	778	
	AE	5,764,486	06/1998	Pendse	361	774	
	AF	5,774,340	06/1998	Chang et al.	361	771	
	AG	5,789,271	08/1998	Akram	438	18	
	AH	5,798,285	08/1998	Bentlage et al.	438	108	
	AI	5,801,072	09/1998	Barber	438	107	
	AJ	5,801,447	09/1998	Hirano et al.	257	778	
	AK	5,803,340	09/1998	Yeh et al.	228	56.3	
	AL	5,804,771	09/1998	McMahon et al.	174	255	
	AM	5,808,360	09/1998	Akram	257	738	

**Foreign Patent Documents**

							Translation	
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	AO							

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**U.S. Patent Documents**

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	5,811,879	09/1998	Akram	257	723	
	AB	5,817,541	10/1998	Averkio et al.	438	107	
	AC	5,822,856	10/1998	Bhatt et al.	29	832	
	AD	5,834,844	11/1998	Akagawa et al.	257	734	
	AE	5,861,666	01/1999	Bellaar	257	686	
	AF	5,863,816	01/1999	Cho	438	123	
	AG	5,870,289	02/1999	Tokuda et al.	361	779	
	AH	5,883,435	03/1999	Geffken et al.	257	758	
	AI	5,925,931	07/1999	Yamamoto	257	737	
	AJ	5,994,222	11/1999	Smith et al.	438	689	
	AK	6,012,224	01/2000	DiStefano et al.	29	840	
	AL	6,013,877	01/2000	Degani et al.	174	264	
	AM	6,018,196	01/2000	Noddin	257	777	

**Foreign Patent Documents**

							Translation	
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	AO							

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**U.S. Patent Documents**

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	AA	6,020,561	02/2000	Ishida et al.	174	261	
	AB	6,037,665	03/2000	Miyazaki	257	773	
	AC	6,046,909	04/2000	Joy	361	748	
	AD	6,084,297	06/2000	Brooks et al.	257	698	
	AE	6,084,781	07/2000	Klein	361	771	
	AF	6,103,552	08/2000	Lin	438	113	
	AG	6,103,992	08/2000	Noddin	219	121.71	
	AH	6,127,204	10/2000	Isaacs et al.	438	106	
	AI						
	AJ						
	AK						
	AL						
	AM						

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	AA	4,442,967	04/1984	van de Pas et al.	228	159	
	AB	4,661,192	04/1987	McShane	156	292	
	AC	4,717,066	01/1988	Goldenberg et al.	228	179	
	AD	4,750,666	06/1988	Neugebauer et al.	228	160	
	AE	4,807,021	02/1989	Okumura	357	75	
	AF	4,925,083	05/1990	Farassat et al.	228	102	
	AG	4,937,653	06/1990	Blonder et al.	357	68	
	AH	5,014,111	05/1991	Tsuda et al.	357	68	
	AI	5,060,843	10/1991	Yasuzato et al.	228	179	
	AJ	5,090,119	02/1992	Tsuda et al.	29	843	
	AK	5,172,851	12/1992	Matsushita et al.	228	179	
	AL	5,294,038	03/1994	Nakano et al.	228	179.1	
	AM	5,364,004	11/1994	Davidson	228	1.1	

**Foreign Patent Documents**

							Translation	
		Document	Date	Country	Class	Subclass	Yes	No
	AN							
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	AA	5,485,949	01/1996	Tomura et al.	228	180.5	
	AB	5,686,353	11/1997	Yagi et al.	437	183	
	AC	5,813,115	09/1998	Misawa et al.	29	832	
	AD	6,017,812	01/2000	Yonezawa et al.	438	613	
	AE	6,088,236	07/2000	Tomura et al.	361	783	
	AF						
	AG						
	AH	4,368,252	01/1983	Kakuhashi et al.	430	312	
	AI	4,404,059	09/1983	Livshits et al.	156	629	
	AJ	5,116,459	05/1992	Kordus et al.	156	631	
	AK	5,600,884	02/1997	Kondo et al.	29	852	
	AL	5,653,891	08/1997	Otsuki et al.	216	11	
	AM	6,274,057	08/2001	Sexton et al.	216	27	

**Foreign Patent Documents**

							Translation	
		Document	Date	Country	Class	Subclass	Yes	No
	AN	62-241345	10/1987	JP	H01L	21/60		X
	AO							

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